



Complete Summary

GUIDELINE TITLE

Guidelines for infection control in dental health-care settings-2003.

BIBLIOGRAPHIC SOURCE(S)

Kohn WG, Collins AS, Cleveland JL, Harte JA, Eklund KJ, Malvitz DM. Guidelines for infection control in dental health-care settings--2003. MMWR Recomm Rep 2003 Dec 19;52(RR-17):1-61. [471 references]

COMPLETE SUMMARY CONTENT

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IMPLEMENTATION OF THE GUIDELINE

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT

CATEGORIES

IDENTIFYING INFORMATION AND AVAILABILITY

SCOPE

DISEASE/CONDITION(S)

Infections associated with dental care

GUIDELINE CATEGORY

Prevention

CLINICAL SPECIALTY

Dentistry

Infectious Diseases

INTENDED USERS

Allied Health Personnel

Dentists

GUIDELINE OBJECTIVE(S)

To provide appropriate recommendations for infection control in dental settings

TARGET POPULATION

- Patients receiving dental care
- Dental health-care personnel (DHCP) providing dental care

INTERVENTIONS AND PRACTICES CONSIDERED

1. Written infection control program
2. Education and training
3. Immunizations
4. Universal precautions
5. Engineering and work-practice controls
6. Post-exposure management and prophylaxis
7. Hand hygiene
8. Personnel protective equipment (PPE), such as masks, protective eyewear, face shields, protective clothing, and gloves
9. Sterilization and disinfection of patient-care items
10. Environmental infection control practices, considering items such as cleaning products, surfaces to be cleaned, and medical waste
11. Dental unit waterlines, biofilm, and water quality monitoring
12. Routine evaluation of infection-control program

MAJOR OUTCOMES CONSIDERED

- Risk of exposure
- Effectiveness of interventions used to prevent disease transmission

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Primary Sources)
Hand-searches of Published Literature (Secondary Sources)
Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Not stated

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Expert Consensus

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

METHODS USED TO ANALYZE THE EVIDENCE

Systematic Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

The guidelines were developed by Centers for Disease Control and Prevention (CDC) staff members in collaboration with other authorities on infection control. Existing guidelines and published research pertinent to dental infection-control principles and practices were reviewed. Wherever possible, recommendations are based on data from well-designed scientific studies. In the absence of scientific evidence, certain recommendations are based on strong theoretical rationale, suggestive evidence, or opinions of respected authorities based on clinical experience, descriptive studies, or committee reports. In addition, some recommendations are derived from federal regulations. No recommendations are offered for practices for which insufficient scientific evidence or lack of consensus supporting their effectiveness exists.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Rankings are based on the system used by Centers for Disease Control and Prevention (CDC) and the Healthcare Infection Control Practices Advisory Committee (HICPAC) to categorize recommendations.

Category I A. Strongly recommended for implementation and strongly supported by well-designed experimental, clinical, or epidemiologic studies

Category I B. Strongly recommended for implementation and supported by experimental, clinical, or epidemiologic studies and a strong theoretical rationale

Category I C. Required for implementation as mandated by federal or state regulation or standard. When IC is used, a second rating can be included to provide the basis of existing scientific data, theoretical rationale, and applicability. Because of state differences, the reader should not assume that the absence of a IC implies the absence of state regulations.

Category II. Suggested for implementation and supported by suggestive clinical or epidemiologic studies or a theoretical rationale

Unresolved issue. No recommendation. Insufficient evidence or no consensus regarding efficacy exists

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

External Peer Review
Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Draft documents were reviewed by other federal agencies and professional organizations from the fields of dental health care, public health, and hospital epidemiology and infection control. A Federal Register notice elicited public comments that were considered in the decision-making process.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

The levels of recommendations (IA, IB, IC, II, Unresolved issues) are defined at the end of the "Major Recommendations" field.

- I. Personnel Health Elements of an Infection-Control Program
 - A. General Recommendations
 1. Develop a written health program for dental health-care personnel (DHCP) that includes policies, procedures, and guidelines for education and training; immunizations; exposure prevention and postexposure management; medical conditions, work-related illness, and associated work restrictions; contact dermatitis and latex hypersensitivity; and maintenance of records, data management, and confidentiality (IB) (Bolyard et al., 1998; Gershon et al., 2000; CDC, "Immunization of health-care workers," 1997; DeCastro et al., 1999; Herwaldt et al., 1997).
 2. Establish referral arrangements with qualified health-care professionals to ensure prompt and appropriate provision of preventive services, occupationally related medical services, and postexposure management with medical follow-up (IB, IC) (Bolyard et al., 1998; US Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, 2001; "Updated U.S. Public Health Service guidelines," 2001; Herwaldt et al., 1997).
 - B. Education and Training
 1. Provide DHCP 1) on initial employment, 2) when new tasks or procedures affect the employee's occupational exposure, and

- 3) at a minimum, annually, with education and training regarding occupational exposure to potentially infectious agents and infection-control procedures/protocols appropriate for and specific to their assigned duties (IB, IC) (Bolyard et al. 1998; Garner, 1996; US Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, 2001; US Department of Labor, Occupational Safety and Health Administration, "OSHA instruction," 2001; Gershon et al., 2000; "Updated U.S. Public Health Service guidelines," 2001; Herwaldt et al., 1997).
 2. Provide educational information appropriate in content and vocabulary to the educational level, literacy, and language of DHCP (IB, IC) (Bolyard et al. 1998; US Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, 2001).
- C. Immunization Programs
1. Develop a written comprehensive policy regarding immunizing DHCP, including a list of all required and recommended immunizations (IB) (Bolyard et al. 1998; CDC, "Immunization of health-care workers," 1997; DeCastro et al., 1999).
 2. Refer DHCP to a prearranged qualified healthcare professional or to their own health-care professional to receive all appropriate immunizations based on the latest recommendations as well as their medical history and risk for occupational exposure (IB) (Bolyard et al. 1998; CDC, "Immunization of health-care workers," 1997).
- D. Exposure Prevention and Postexposure Management
1. Develop a comprehensive postexposure management and medical follow-up program (IB, IC) (Bolyard et al. 1998; US Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, 2001; US Department of Labor, Occupational Safety and Health Administration, "OSHA instruction," 2001; "Updated U.S. Public Health Service guidelines," 2001).
 - a. Include policies and procedures for prompt reporting, evaluation, counseling, treatment, and medical follow-up of occupational exposures.
 - b. Establish mechanisms for referral to a qualified health-care professional for medical evaluation and follow-up.
 - c. Conduct a baseline tuberculin skin test (TST), preferably by using a two-step test, for all DHCP who might have contact with persons with suspected or confirmed infectious tuberculosis (TB), regardless of the risk classification of the setting (IB) ("Guidelines for preventing the transmission of *Mycobacterium tuberculosis*," 1994).
- E. Medical Conditions, Work-Related Illness, and Work Restrictions

1. Develop and have readily available to all DHCP comprehensive written policies regarding work restriction and exclusion that include a statement of authority defining who can implement such policies (IB) (Bolyard et al. 1998; Herwaldt et al., 1997).
 2. Develop policies for work restriction and exclusion that encourage DHCP to seek appropriate preventive and curative care and report their illnesses, medical conditions, or treatments that can render them more susceptible to opportunistic infection or exposures; do not penalize DHCP with loss of wages, benefits, or job status (IB) (Bolyard et al. 1998; Herwaldt et al., 1997).
 3. Develop policies and procedures for evaluation, diagnosis, and management of DHCP with suspected or known occupational contact dermatitis (IB) (CDC, National Institute for Occupational Safety and Health [NIOSH], 1997).
 4. Seek definitive diagnosis by a qualified healthcare professional for any DHCP with suspected latex allergy to carefully determine its specific etiology and appropriate treatment as well as work restrictions and accommodations (IB) (CDC, NIOSH, 1997).
- F. Records Maintenance, Data Management, and Confidentiality
1. Establish and maintain confidential medical records (e.g., immunization records and documentation of tests received as a result of occupational exposure) for all DHCP (IB, IC) (Bolyard et al., 1998; US Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, 2001).
 2. Ensure that the practice complies with all applicable federal, state, and local laws regarding medical recordkeeping and confidentiality (IC) (US Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, 2001; "Standards for privacy," 2000).

II. Preventing Transmission of Bloodborne Pathogens

A. Hepatitis B Virus (HBV) Vaccination

1. Offer the hepatitis B virus (HBV) vaccination series to all DHCP with potential occupational exposure to blood or other potentially infectious material (IA, IC) ("Recommended infection-control," 1993; US Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, 2001; US Department of Labor, Occupational Safety and Health Administration, "OSHA instruction," 2001; "Updated U.S. Public Health Service guidelines," 2001).
2. Always follow U.S. Public Health Service/CDC recommendations for hepatitis B vaccination, serologic testing, follow-up, and booster dosing (IA, IC) (US Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, 2001; US Department of Labor, Occupational Safety and Health Administration, "OSHA instruction," 2001; "Updated U.S. Public Health Service guidelines," 2001).
3. Test DHCP for hepatitis B surface antibodies (anti-HBs) 1 to 2 months after completion of the 3-dose vaccination series (IA, IC) (US Department of Labor, Occupational Safety and Health

- Administration, "OSHA instruction," 2001; "Updated U.S. Public Health Service guidelines," 2001).
4. DHCP should complete a second 3-dose vaccine series or be evaluated to determine if they are hepatitis B surface antigen (HBsAg)-positive if no antibody response occurs to the primary vaccine series (IA, IC) (US Department of Labor, Occupational Safety and Health Administration, "OSHA instruction," 2001; "Updated U.S. Public Health Service guidelines," 2001).
 5. Retest for anti-HBs at the completion of the second vaccine series. If no response to the second 3-dose series occurs, nonresponders should be tested for HBsAg (IC) (US Department of Labor, Occupational Safety and Health Administration, "OSHA instruction," 2001; "Updated U.S. Public Health Service guidelines," 2001).
 6. Counsel nonresponders to vaccination who are HBsAg-negative regarding their susceptibility to HBV infection and precautions to take (IA, IC) (US Department of Labor, Occupational Safety and Health Administration, "OSHA instruction," 2001; "Updated U.S. Public Health Service guidelines," 2001).
 7. Provide employees appropriate education regarding the risks of HBV transmission and the availability of the vaccine. Employees who decline the vaccination should sign a declination form to be kept on file with the employer (IC) (US Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, 2001).
- B. Preventing Exposures to Blood and Other Potentially Infectious Materials (OPIM)
1. General recommendations
 - a. Use standard precautions (Occupational Safety and Health Administration's [OSHA's] blood-borne pathogen standard retains the term universal precautions) for all patient encounters (IA, IC) (Garner, 1996; US Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, 2001; "Updated U.S. Public Health Service guidelines," 2001; "Recommendations for preventing transmission," 1991).
 - b. Consider sharp items (e.g., needles, scalers, burs, lab knives, and wires) that are contaminated with patient blood and saliva as potentially infective, and establish engineering controls and work practices to prevent injuries (IB, IC) (Greene, 1969; US Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, 2001; "Recommendations for prevention of HIV," 1987).
 - c. Implement a written, comprehensive program designed to minimize and manage DHCP exposures to blood and body fluids (IB, IC). (US Department of Labor, Occupational Safety and Health Administration, "OSHA instruction," 2001; US Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, 2001; "Updated U.S. Public Health Service guidelines," 2001; CDC, NIOSH, 1999).

2. Engineering and work-practice controls
 - a. Identify, evaluate, and select devices with engineered safety features at least annually and as they become available on the market (e.g., safer anesthetic syringes, blunt suture needle, retractable scalpel, or needleless intravenous [IV] systems) (IC) (US Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, 2001; "Framework for program evaluation," 1999; CDC, "Evaluation of safety devices," 1997; CDC, "Evaluation of blunt suture needles," 1997; Mendelson et al., 2003).
 - b. Place used disposable syringes and needles, scalpel blades, and other sharp items in appropriate puncture-resistant containers located as close as feasible to the area in which the items are used (IA, IC) ("Recommended infection control," 1993; "Update: universal precautions," 1988; US Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, 2001; "Updated U.S. Public Health Service guidelines," 2001; "Recommendations for prevention of HIV," 1987; CDC, NIOSH, 1998).
 - c. Do not recap used needles by using both hands or any other technique that involves directing the point of a needle toward any part of the body. Do not bend, break, or remove needles before disposal (IA, IC) ("Recommended infection control," 1993; "Update: Universal precautions," 1988; "Guidelines for prevention of transmission," 1989; US Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, 2001; CDC, NIOSH, 1999; "Recommendations for prevention of HIV," 1987).
 - d. Use either a one-handed scoop technique or a mechanical device designed for holding the needle cap when recapping needles (e.g., between multiple injections and before removing from a nondisposable aspirating syringe) (IA, IC) ("Recommended infection control," 1993; "Update: universal precautions," 1988; "Guidelines for prevention of transmission," 1989; US Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, 2001; US Department of Labor, Occupational Safety and Health Administration, "OSHA instruction," 2001; "Recommendations for prevention of HIV," 1987).
3. Postexposure management and prophylaxis
 - a. Follow CDC recommendations after percutaneous, mucous membrane, or nonintact skin exposure to blood or other potentially infectious material (IA, IC) (US Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, 2001; US Department of Labor, Occupational Safety and Health Administration, "OSHA instruction," 2001; "Updated U.S. Public Health Service guidelines," 2001).

III. Hand Hygiene

A. General Considerations

1. Perform hand hygiene with either a nonantimicrobial or an antimicrobial soap and water when hands are visibly dirty or contaminated with blood or other potentially infectious material. If hands are not visibly soiled, an alcohol-based hand rub can also be used. Follow the manufacturer's instructions (IA) (Boyce & Pittet, 2002).
2. Indications for hand hygiene include
 - a. when hands are visibly soiled (IA, IC)
 - b. after barehanded touching of inanimate objects likely to be contaminated by blood, saliva, or respiratory secretions (IA, IC)
 - c. before and after treating each patient (IB)
 - d. before donning gloves (IB)
 - e. immediately after removing gloves (IB, IC) ("Update: Universal precautions," 1988; "Guidelines for prevention of transmission," 1989; Garner & Favero, 1986; Garner, 1996; US Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, 2001; "Recommendations for prevention of HIV," 1987; Steere & Mallison, 1975; Garner, 1986; Association for Professionals in Infection Control and Epidemiology [APIC], 1995; Boyce & Pittet, 2002; Larson et al., 2000; Pittet et al., 2000; Doebbeling et al., 1988).
3. For oral surgical procedures, perform surgical hand antisepsis before donning sterile surgeon's gloves. Follow the manufacturer's instructions by using either an antimicrobial soap and water, or soap and water followed by drying hands and application of an alcohol-based surgical handscrub product with persistent activity (IB) (Garner, 1986; APIC, 1995; Boyce & Pittet, 2002; Price, 1938; Dewar & Gravens, 1973; Lowbury & Lilly, 1960; Rotter, 1999; Widmer, 2000; Larson et al., 1990; Faoagali et al., 1995; Hobson et al., 1998; Mulbury et al., 2001).
4. Store liquid hand-care products in either disposable closed containers or closed containers that can be washed and dried before refilling. Do not add soap or lotion to (i.e., top off) a partially empty dispenser (IA) (Garner & Favero, 1986; Steere & Mallison, 1975; APIC, 1995; Grohskopf et al., 2001; Archibald et al., 1997).

B. Special Considerations for Hand Hygiene and Glove Use

1. Use hand lotions to prevent skin dryness associated with hand washing (IA) (Berndt et al., 2000; McCormick, Buchman, & Maki, 2000).
2. Consider the compatibility of lotion and antiseptic products and the effect of petroleum or other oil emollients on the integrity of gloves during product selection and glove use (IB) ("Recommended infection control," 1993; US Department of Labor, Occupational Safety and Health Administration, "OSHA instruction," 2001; APIC, 1995; Larson et al., 1993).

3. Keep fingernails short with smooth, filed edges to allow thorough cleaning and prevent glove tears (II) (APIC, 1995; Boyce & Pittet, 2002; McGinley, Larson, & Leyden, 1988).
4. Do not wear artificial fingernails or extenders when having direct contact with patients at high risk (e.g., those in intensive care units or operating rooms) (IA) (Boyce & Pittet, 2002; Pottinger, Burns, & Manske, 1989; McNeil et al., 2001; Rubin, 1988; Hedderwick et al., 2000).
5. Use of artificial fingernails is usually not recommended (II) (Pottinger, Burns, & Manske, 1989; McNeil et al., 2001; Rubin, 1988; Hedderwick et al., 2000).
6. Do not wear hand or nail jewelry if it makes donning gloves more difficult or compromises the fit and integrity of the glove (II) (Boyce & Pittet, 2002; Larson, 1989; Field et al., 1996).

IV. Personal Protection Equipment (PPE)

A. Masks, Protective Eyewear, and Face Shields

1. Wear a surgical mask and eye protection with solid side shields or a face shield to protect mucous membranes of the eyes, nose, and mouth during procedures likely to generate splashing or spattering of blood or other body fluids (IB, IC) ("Recommended infection-control practices," 1986; "Recommended infection control," 1993; "Update: universal precautions," 1988; "Guidelines for prevention of transmission," 1989; Garner, 1996; US Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, 2001; Mangram et al., 1999).
2. Change masks between patients or during patient treatment if the mask becomes wet (IB) ("Recommended infection control," 1993).
3. Clean with soap and water, or if visibly soiled, clean and disinfect reusable facial protective equipment (e.g., clinician and patient protective eyewear or face shields) between patients (II) ("Recommended infection control," 1993).

B. Protective Clothing

1. Wear protective clothing (e.g., reusable or disposable gown, laboratory coat, or uniform) that covers personal clothing and skin (e.g., forearms) likely to be soiled with blood, saliva, or other potentially infectious materials (OPIM) (IB, IC) ("Update: universal precautions," 1988; "Guidelines for prevention of transmission," 1989; Garner, 1996; US Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, 2001; Mangram et al., 1999).
2. Change protective clothing if visibly soiled (Association of Perioperative Registered Nurses, 2002); change immediately or as soon as feasible if penetrated by blood or other potentially infectious fluids (IB, IC) (US Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, 2001).
3. Remove barrier protection, including gloves, mask, eyewear, and gown, before departing work area (e.g., dental patient

care, instrument processing, or laboratory areas) (IC) (US Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, 2001).

C. Gloves

1. Wear medical gloves when a potential exists for contacting blood, saliva, OPIM, or mucous membranes (IB, IC) ("Recommended infection-control practices," 1986; "Recommended infection control," 1993; "Update: universal precautions," 1988; "Guidelines for prevention of transmission," 1989; US Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, 2001).
2. Wear a new pair of medical gloves for each patient, remove them promptly after use, and wash hands immediately to avoid transfer of microorganisms to other patients or environments (IB) ("Recommended infection-control practices," 1986; "Update: universal precautions," 1988; "Guidelines for prevention of transmission," 1989; Boyce & Pittet, 2002).
3. Remove gloves that are torn, cut, or punctured as soon as feasible and wash hands before regloving (IB, IC) (US Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, 2001; Wright et al., 1991, Dodds et al., 1988).
4. Do not wash surgeon's or patient examination gloves before use or wash, disinfect, or sterilize gloves for reuse (IB, IC) (US Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, 2001; Doebbeling et al., 1988; DeGroot-Kosolcharoen & Jones, 1989; Adams et al., 1992; Martin et al., 1988).
5. Ensure that appropriate gloves in the correct size are readily accessible (IC) (US Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, 2001).
6. Use appropriate gloves (e.g., puncture- and chemical resistant utility gloves) when cleaning instruments and performing housekeeping tasks involving contact with blood or OPIM (IB, IC) ("Update: universal precautions," 1988; US Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, 2001; US Department of Labor, Occupational Safety and Health Administration, 1994).
7. Consult with glove manufacturers regarding the chemical compatibility of glove material and dental materials used (II).

D. Sterile Surgeon's Gloves and Double Gloving During Oral Surgical Procedures

1. Wear sterile surgeon's gloves when performing oral surgical procedures (IB) ("Recommended infection control," 1993; "Guidelines for prevention of transmission," 1989; Mangram et al., 1999).
2. No recommendation is offered regarding the effectiveness of wearing two pairs of gloves to prevent disease transmission during oral surgical procedures. The majority of studies among health-care personnel (HCP) and DHCP have demonstrated a

lower frequency of inner glove perforation and visible blood on the surgeon's hands when double gloves are worn; however, the effectiveness of wearing two pairs of gloves in preventing disease transmission has not been demonstrated (Unresolved issue).

V. Contact Dermatitis and Latex Hypersensitivity

A. General Recommendations

1. Educate DHCP regarding the signs, symptoms, and diagnoses of skin reactions associated with frequent hand hygiene and glove use (IB) (Bolyard et al., 1998; "The dental team," 1999; CDC, NIOSH, 1997).
2. Screen all patients for latex allergy (e.g., take health history and refer for medical consultation when latex allergy is suspected) (IB) (CDC, NIOSH, 1997).
3. Ensure a latex-safe environment for patients and DHCP with latex allergy (IB) (CDC, NIOSH, 1997).
4. Have emergency treatment kits with latex-free products available at all times (II) (CDC, NIOSH, 1997).

VI. Sterilization and Disinfection of Patient-Care Items

A. General Recommendations

1. Use only U.S. Food and Drug Administration (FDA)-cleared medical devices for sterilization and follow the manufacturer's instructions for correct use (IB) (Association for the Advancement of Medical Instrumentation, American National Standards Institute, 1998).
2. Clean and heat-sterilize critical dental instruments before each use (IA) ("Recommended infection control," 1993; Mangram et al., 1999; CDC, in press; Sehulster & Chinn, 2003; Food and Drug Administration, 1992; Favero & Bond, 2001; "Infection control recommendations for the dental office," 1996).
3. Clean and heat-sterilize semicritical items before each use (IB) ("Recommended infection control," 1993; Favero & Bond, 2001; Miller & Palenik, 2001; "Infection control recommendations for the dental office," 1996).
4. Allow packages to dry in the sterilizer before they are handled to avoid contamination (IB) (Association for the Advancement of Medical Instrumentation, American National Standards Institute, 2002).
5. Use of heat-stable semicritical alternatives is encouraged (IB) ("Recommended infection control," 1993).
6. Reprocess heat-sensitive critical and semi-critical instruments by using FDA-cleared sterilant/ high-level disinfectants or an FDA-cleared low-temperature sterilization method (e.g., ethylene oxide). Follow manufacturer's instructions for use of chemical sterilants/high-level disinfectants (IB) (CDC, in press).
7. Single-use disposable instruments are acceptable alternatives if they are used only once and disposed of correctly (IB, IC) (CDC, in press; Food and Drug Administration, 2001).

8. Do not use liquid chemical sterilants/high-level disinfectants for environmental surface disinfection or as holding solutions (IB, IC) (CDC, in press; US Environmental Protection Agency, 1996).
 9. Ensure that noncritical patient-care items are barrier-protected or cleaned, or if visibly soiled, cleaned and disinfected after each use with an Environmental Protection Agency (EPA)-registered hospital disinfectant. If visibly contaminated with blood, use an EPA-registered hospital disinfectant with a tuberculocidal claim (i.e., intermediate level) (IB) ("Recommended infection control," 1993; CDC, in press; Sehulster & Chinn, 2003).
 10. Inform DHCP of all OSHA guidelines for exposure to chemical agents used for disinfection and sterilization. Using this report, identify areas and tasks that have potential for exposure (IC) (US Department of Labor, 1994).
- B. Instrument Processing Area
1. Designate a central processing area. Divide the instrument processing area, physically or, at a minimum, spatially, into distinct areas for 1) receiving, cleaning, and decontamination; 2) preparation and packaging; 3) sterilization; and 4) storage. Do not store instruments in an area where contaminated instruments are held or cleaned (II) (Miller & Palenik, 1998; Association for the Advancement of Medical Instrumentation, American National Standards Institute, 1998 & 2002).
 2. Train DHCP to employ work practices that prevent contamination of clean areas (II).
- C. Receiving, Cleaning, and Decontamination Work Area
1. Minimize handling of loose contaminated instruments during transport to the instrument processing area. Use work-practice controls (e.g., carry instruments in a covered container) to minimize exposure potential (II). Clean all visible blood and other contamination from dental instruments and devices before sterilization or disinfection procedures (IA) (CDC, in press; Favero & Bond, 2001; Parker & Johnson, 1995; Alfa et al., 1998; Rutala & Weber, 1998).
 2. Use automated cleaning equipment (e.g., ultrasonic cleaner or washer-disinfector) to remove debris to improve cleaning effectiveness and decrease worker exposure to blood (IB) ("Recommended infection control," 1993; Miller et al., 2000).
 3. Use work-practice controls that minimize contact with sharp instruments if manual cleaning is necessary (e.g., long-handled brush) (IC) (US Department of Labor, Occupational Safety and Health Administration, "OSHA instructions," 2001).
 4. Wear puncture- and chemical-resistant/heavy-duty utility gloves for instrument cleaning and decontamination procedures (IB) ("Update: universal precautions," 1988).
 5. Wear appropriate personal protection equipment (PPE) (e.g., mask, protective eyewear, and gown) when splashing or spraying is anticipated during cleaning (IC) (US Department of

Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, 2001).

D. Preparation and Packaging

1. Use an internal chemical indicator in each package. If the internal indicator cannot be seen from outside the package, also use an external indicator (II) (CDC, in press; Association for the Advancement of Medical Instrumentation, 1999; Association for the Advancement of Medical Instrumentation, American National Standards Institute, 1993).
2. Use a container system or wrapping compatible with the type of sterilization process used and that has received FDA clearance (IB) (CDC, in press; Association for the Advancement of Medical Instrumentation, American National Standards Institute, 2002; Rutala & Weber, 2000).
3. Before sterilization of critical and semicritical instruments, inspect instruments for cleanliness, then wrap or place them in containers designed to maintain sterility during storage (e.g., cassettes and organizing trays) (IA) ("Recommended infection control," 1993; Association for the Advancement of Medical Instrumentation, American National Standards Institute, 2002; Ninemeier, 1998; Rutala & Weber, 2000).

E. Sterilization of Unwrapped Instruments

1. Clean and dry instruments before the unwrapped sterilization cycle (IB) (Association for the Advancement of Medical Instrumentation, American National Standards Institute, 1998).
2. Use mechanical and chemical indicators for each unwrapped sterilization cycle (i.e., place an internal chemical indicator among the instruments or items to be sterilized) (IB) (CDC, in press; Association for the Advancement of Medical Instrumentation, American National Standards Institute, 1996).
3. Allow unwrapped instruments to dry and cool in the sterilizer before they are handled to avoid contamination and thermal injury (II) (Miller & Palenik, 2001).
4. Semicritical instruments that will be used immediately or within a short time can be sterilized unwrapped on a tray or in a container system, provided that the instruments are handled aseptically during removal from the sterilizer and transport to the point of use (II).
5. Critical instruments intended for immediate reuse can be sterilized unwrapped if the instruments are maintained sterile during removal from the sterilizer and transport to the point of use (e.g., transported in a sterile covered container) (IB) (Association for the Advancement of Medical Instrumentation, American National Standards Institute, 1996).
6. Do not sterilize implantable devices unwrapped (IB) (CDC, in press; Association for the Advancement of Medical Instrumentation, American National Standards Institute, 2002).
7. Do not store critical instruments unwrapped (IB) (Association for the Advancement of Medical Instrumentation, American National Standards Institute, 1998).

F. Sterilization Monitoring

1. Use mechanical, chemical, and biological monitors according to the manufacturer's instructions to ensure the effectiveness of the sterilization process (IB) (Association for the Advancement of Medical Instrumentation, American National Standards Institute, 1998; Greene, 1992; Favero, 1998).
2. Monitor each load with mechanical (e.g., time, temperature, and pressure) and chemical indicators (II) (CDC, in press; Association for the Advancement of Medical Instrumentation, American National Standards Institute, 1998).
3. Place a chemical indicator on the inside of each package. If the internal indicator is not visible from the outside, also place an exterior chemical indicator on the package (II) (CDC, in press; Association for the Advancement of Medical Instrumentation, 1999; Association for the Advancement of Medical Instrumentation, American National Standards Institute, 1993).
4. Place items/packages correctly and loosely into the sterilizer so as not to impede penetration of the sterilant (IB) (CDC, in press).
5. Do not use instrument packs if mechanical or chemical indicators indicate inadequate processing (IB) (CDC, in press; Association for the Advancement of Medical Instrumentation, American National Standards Institute, 1998 & 2002).
6. Monitor sterilizers at least weekly by using a biological indicator with a matching control (i.e., biological indicator and control from same lot number) (IB) ("Recommended infection control," 1993; Garner & Favero, 1986; CDC, in press; Association for the Advancement of Medical Instrumentation, American National Standards Institute, 2002; Greene, 1992; Favero, 1998).
7. Use a biological indicator for every sterilizer load that contains an implantable device. Verify results before using the implantable device, whenever possible (IB) (CDC, in press; Association for the Advancement of Medical Instrumentation, American National Standards Institute, 1998).
8. The following are recommended in the case of a positive spore test:
 - a. Remove the sterilizer from service and review sterilization procedures (e.g., work practices and use of mechanical and chemical indicators) to determine whether operator error could be responsible (II) ("Guidelines for prevention of transmission," 1989).
 - b. Retest the sterilizer by using biological, mechanical, and chemical indicators after correcting any identified procedural problems (II).
 - c. If the repeat spore test is negative, and mechanical and chemical indicators are within normal limits, put the sterilizer back in service (II) (Garner & Favero, 1986; CDC, in press).
9. The following are recommended if the repeat spore test is positive:

- a. Do not use the sterilizer until it has been inspected or repaired or the exact reason for the positive test has been determined (II) (Garner & Favero, 1986; CDC, in press).
 - b. Recall, to the extent possible, and reprocess all items processed since the last negative spore test (II) (Garner & Favero, 1986; CDC, in press; Association of Operating Room Nurses, 1987).
 - c. Before placing the sterilizer back in service, rechallenge the sterilizer with biological indicator tests in three consecutive empty chamber sterilization cycles after the cause of the sterilizer failure has been determined and corrected (II) (Garner & Favero, 1986; CDC, in press; Association of Operating Room Nurses, 1987).
10. Maintain sterilization records (i.e., mechanical, chemical, and biological) in compliance with state and local regulations (IB) (CDC, in press).

G. Storage Area for Sterilized Items and Clean Dental Supplies

1. Implement practices on the basis of date- or event-related shelf-life for storage of wrapped, sterilized instruments and devices (IB) (CDC, in press; Mayworm, 1984).
2. Even for event-related packaging, at a minimum, place the date of sterilization, and if multiple sterilizers are used in the facility, the sterilizer used, on the outside of the packaging material to facilitate the retrieval of processed items in the event of a sterilization failure (IB) (CDC, in press; Association for the Advancement of Medical Instrumentation, American National Standards Institute, 2002).
3. Examine wrapped packages of sterilized instruments before opening them to ensure the barrier wrap has not been compromised during storage (II) (CDC, in press; Mayworm, 1984).
4. Reclean, repack, and resterilize any instrument package that has been compromised (II).
5. Store sterile items and dental supplies in covered or closed cabinets, if possible (II) (Cardo & Schulster, 1999).

VII. Environmental Infection Control

A. General Recommendations

1. Follow the manufacturers' instructions for correct use of cleaning and EPA-registered hospital disinfecting products (IB, IC) (CDC, in press; Schulster & Chinn, 2003; US Environmental Protection Agency, 1996).
2. Do not use liquid chemical sterilants/high-level disinfectants for disinfection of environmental surfaces (clinical contact or housekeeping) (IB, IC) (CDC, in press; Schulster & Chinn, 2003; US Environmental Protection Agency, 1996).
3. Use PPE, as appropriate, when cleaning and disinfecting environmental surfaces. Such equipment might include gloves (e.g., puncture- and chemical-resistant utility), protective clothing (e.g., gown, jacket, or lab coat), and protective

eyewear/face shield, and mask (IC) (US Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, 2001; US Department of Labor, Occupational Safety and Health Administration, 1994).

B. Clinical Contact Surfaces

1. Use surface barriers to protect clinical contact surfaces, particularly those that are difficult to clean (e.g., switches on dental chairs) and change surface barriers between patients (II) ("Recommended infection-control practices," 1986; "Recommended infection control," 1993; Miller & Palenik, 2001; Crawford, 1987).
2. Clean and disinfect clinical contact surfaces that are not barrier-protected by using an EPA-registered hospital disinfectant with a low- (i.e., human immunodeficiency virus [HIV] and hepatitis B virus [HBV] label claims) to intermediate-level (i.e., tuberculocidal claim) activity after each patient. Use an intermediate-level disinfectant if visibly contaminated with blood (IB) (CDC, in press; "Recommended infection control," 1993; Sehulster & Chinn, 2003).

C. Housekeeping Surfaces

1. Clean housekeeping surfaces (e.g., floors, walls, and sinks) with a detergent and water or an EPA-registered hospital disinfectant/detergent on a routine basis, depending on the nature of the surface and type and degree of contamination, and as appropriate, based on the location in the facility, and when visibly soiled (IB) (CDC, in press; Sehulster & Chinn, 2003).
2. Clean mops and cloths after use and allow to dry before reuse; or use single-use, disposable mop heads or cloths (II) (CDC, in press; Sehulster & Chinn, 2003).
3. Prepare fresh cleaning or EPA-registered disinfecting solutions daily and as instructed by the manufacturer. (II) (CDC, in press; Sehulster & Chinn, 2003).
4. Clean walls, blinds, and window curtains in patient-care areas when they are visibly dusty or soiled (II) (Garner & Favero, 1986; Sehulster & Chinn, 2003;).

D. Spills of Blood and Body Substances

1. Clean spills of blood or OPIM and decontaminate surface with an EPA-registered hospital disinfectant with low- (i.e., HBV and HIV label claims) to intermediate-level (i.e., tuberculocidal claim) activity, depending on size of spill and surface porosity (IB, IC) (US Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, 2001; "Recommendations for prevention of HIV," 1987).

E. Carpet and Cloth Furnishings

1. Avoid using carpeting and cloth-upholstered furnishings in dental operatories, laboratories, and instrument processing

areas (II) (Garner & Favero, 1986; Gerson et al., 1994; Suzuki et al. 1984; Skoutelis et al., 1994).

F. Regulated Medical Waste

1. General Recommendations
 - a. Develop a medical waste management program. Disposal of regulated medical waste must follow federal, state, and local regulations (IC) (US Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, 2001; US Environmental Protection Agency, 1997).
 - b. Ensure that DHCP who handle and dispose of regulated medical waste are trained in appropriate handling and disposal methods and informed of the possible health and safety hazards (IC) (US Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, 2001).
2. Management of Regulated Medical Waste in Dental Health-Care Facilities
 - a. Use a color-coded or labeled container that prevents leakage (e.g., biohazard bag) to contain nonsharp regulated medical waste (IC) (US Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, 2001).
 - b. Place sharp items (e.g., needles, scalpel blades, orthodontic bands, broken metal instruments, and burs) in an appropriate sharps container (e.g., puncture resistant, color-coded, and leakproof). Close container immediately before removal or replacement to prevent spillage or protrusion of contents during handling, storage, transport, or shipping (IC) ("Recommended infection control," 1993; "Guidelines for prevention of transmission," 1989; US Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, 2001; "Recommendations for prevention of HIV," 1987; CDC, NIOSH, 1998).
 - c. Pour blood, suctioned fluids, or other liquid waste carefully into a drain connected to a sanitary sewer system, if local sewage discharge requirements are met and the state has declared this an acceptable method of disposal. Wear appropriate PPE while performing this task (IC) ("Update: universal precautions," 1988; Garner & Favero, 1986; US Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, 2001).

VIII. Dental Unit Waterlines, Biofilm, and Water Quality

A. General Recommendations

1. Use water that meets EPA regulatory standards for drinking water (i.e., ≤ 500 CFU/mL of heterotrophic water bacteria) for routine dental treatment output water (IB, IC) (US Environmental Protection Agency, 1999; American Public Health

Association, American Water Works Association, Water Environment Foundation, 1999).

2. Consult with the dental unit manufacturer for appropriate methods and equipment to maintain the recommended quality of dental water (II) (Shearer, 1996).
3. Follow recommendations for monitoring water quality provided by the manufacturer of the unit or waterline treatment product (II).
4. Discharge water and air for a minimum of 20 to 30 seconds after each patient, from any device connected to the dental water system that enters the patient's mouth (e.g., handpieces, ultrasonic scalers, and air/water syringes) (II) ("Recommended infection control," 1993; Bagga et al., 1984; Scheid, Rosen, & Beck, 1990).
5. Consult with the dental unit manufacturer on the need for periodic maintenance of antiretraction mechanisms (IB) ("Recommended infection control," 1993; Bagga et al., 1984).

B. Boil-Water Advisories

1. The following apply while a boil-water advisory is in effect:
 - a. Do not deliver water from the public water system to the patient through the dental operative unit, ultrasonic scaler, or other dental equipment that uses the public water system (IB, IC) (US Environmental Protection Agency, 1999; American Public Health Association, American Water Works Association, Water Environment Foundation, 1999; CDC, Working Group on Waterborne Cryptosporidiosis, 1997; "Assessing the public health threat," 1995; Kramer et al., 1996).
 - b. Do not use water from the public water system for dental treatment, patient rinsing, or handwashing (IB, IC) (US Environmental Protection Agency, 1999; American Public Health Association, American Water Works Association, Water Environment Foundation, 1999; CDC, Working Group on Waterborne Cryptosporidiosis, 1997; "Assessing the public health threat," 1995; Kramer et al., 1996).
 - c. For handwashing, use antimicrobial containing products that do not require water for use (e.g., alcohol-based hand rubs). If hands are visibly contaminated, use bottled water, if available, and soap for handwashing or an antiseptic towelette (IB, IC) (US Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, 2001; APIC, 1995).
2. The following apply when the boil-water advisory is cancelled:
 - a. Follow guidance given by the local water utility regarding adequate flushing of waterlines. If no guidance is provided, flush dental waterlines and faucets for 1 to 5 minutes before using for patient care (IC)) (Sehulster & Chinn, 2003; CDC, Working Group on Waterborne Cryptosporidiosis, 1997; Office of Water, US Environmental Protection Agency, 2000; US Environmental Protection Agency, 2000).

- b. Disinfect dental waterlines as recommended by the dental unit manufacturer (II).

IX. Special Considerations

A. Dental Handpieces and Other Devices Attached to Air and Waterlines

1. Clean and heat-sterilize handpieces and other intraoral instruments that can be removed from the air and waterlines of dental units between patients (I B, I C) ("Recommended infection control," 1993; Food and Drug Administration, 1992; Pratt et al., 1999; Lewis et al., 1992; Lewis & Boe, 1992; Kolstad, 1998; "Infection control recommendations for the dental office," 1996).
2. Follow the manufacturer's instructions for cleaning, lubrication, and sterilization of handpieces and other intraoral instruments that can be removed from the air and waterlines of dental units (I B) (Kuehne, Cohen, & Monroe, 1992; Andersen, Fiehn, & Larsen, 1999; Leonard & Charlton, 1999).
3. Do not surface-disinfect, use liquid chemical sterilants, or ethylene oxide on handpieces and other intraoral instruments that can be removed from the air and waterlines of dental units (I C) ("Recommended infection control," 1993; Food and Drug Administration, 1992; Parker & Johnson, 1995; Pratt et al., 1999).
4. Do not advise patients to close their lips tightly around the tip of the saliva ejector to evacuate oral fluids (II) (Barbeau et al., 1998; Mann, Campbell, & Crawford, 1996; Watson & Whitehouse, 1993).

B. Dental Radiology

1. Wear gloves when exposing radiographs and handling contaminated film packets. Use other PPE (e.g., protective eyewear, mask, and gown) as appropriate if spattering of blood or other body fluids is likely (I A, I C) (Garner, 1996; US Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, 2001).
2. Use heat-tolerant or disposable intraoral devices whenever possible (e.g., film-holding and positioning devices). Clean and heat-sterilize heat-tolerant devices between patients. At a minimum, high-level disinfect semicritical heat-sensitive devices, according to manufacturer's instructions (I B) (CDC, in press).
3. Transport and handle exposed radiographs in an aseptic manner to prevent contamination of developing equipment (II).
4. The following apply for digital radiography sensors:
 - a. Use FDA-cleared barriers (I B) (CDC, in press).
 - b. Clean and heat-sterilize, or high-level disinfect, between patients, barrier-protected semicritical items. If the item cannot tolerate these procedures then, at a minimum, protect with an FDA-cleared barrier and clean and disinfect with an EPA-registered hospital disinfectant

with intermediate-level (i.e., tuberculocidal claim) activity, between patients. Consult with the manufacturer for methods of disinfection and sterilization of digital radiology sensors and for protection of associated computer hardware (I B) (CDC, in press).

C. Aseptic Technique for Parenteral Medications

1. Do not administer medication from a syringe to multiple patients, even if the needle on the syringe is changed (I A) (American Society of Anesthesiologists, 1999).
2. Use single-dose vials for parenteral medications when possible (I I) ("ASHP guidelines on quality assurance," 2000; Green et al., 1995).
3. Do not combine the leftover contents of single-use vials for later use (I A) ("ASHP guidelines on quality assurance," 2000; Green et al., 1995).
4. The following apply if multidose vials are used:
 - a. Cleanse the access diaphragm with 70% alcohol before inserting a device into the vial (I A) (Plott, Wagner, & Tyring, 1990; Arrington et al., 1990).
 - b. Use a sterile device to access a multiple-dose vial and avoid touching the access diaphragm. Both the needle and syringe used to access the multidose vial should be sterile. Do not reuse a syringe even if the needle is changed (I A) (Plott, Wagner, & Tyring, 1990; Arrington et al., 1990).
 - c. Keep multidose vials away from the immediate patient treatment area to prevent inadvertent contamination by spray or spatter (I I).
 - d. Discard the multidose vial if sterility is compromised (I A) (Plott, Wagner, & Tyring, 1990; Arrington et al., 1990).
5. Use fluid infusion and administration sets (i.e., IV bags, tubings, and connections) for one patient only and dispose of appropriately (I B) (American Society of Anesthesiologists, 1999).

D. Single-Use (Disposable) Devices

1. Use single-use devices for one patient only and dispose of them appropriately (I C) (Food and Drug Administration, 2001).

E. Preprocedural Mouth Rinses

1. No recommendation is offered regarding use of preprocedural antimicrobial mouth rinses to prevent clinical infections among DHCP or patients. Although studies have demonstrated that a preprocedural antimicrobial rinse (e.g., chlorhexidine gluconate, essential oils, or povidone-iodine) can reduce the level of oral microorganisms in aerosols and spatter generated during routine dental procedures and can decrease the number of microorganisms introduced in the patient's bloodstream during invasive dental procedures (Litsky, Mascis, & Litsky, 1970; Mohammed & Monserrate, 1970; Wyler, Miller, & Micik, 1971; Muir et al., 1978; Fine, Furgang et al., 1992; Fine, Yip et al., 1993; Fine et al., 1993; Logothetis & Martinez-Welles, 1995;

Klyn et al., 2001), the scientific evidence is inconclusive that using these rinses prevents clinical infections among DHCP or patients (see discussion, Preprocedural Mouth Rinses in the original guideline document) (Unresolved issue).

F. Oral Surgical Procedures

1. The following apply when performing oral surgical procedures:
 - a. Perform surgical hand antisepsis by using an antimicrobial product (e.g., antimicrobial soap and water, or soap and water followed by alcohol-based hand scrub with persistent activity) before donning sterile surgeon's gloves (IB) (Price, 1938; Dewar & Gravens, 1973; Lowbury & Lilly, 1960; Rotter, 1999; Widmer 2000; Larson et al., 1990; Mangram et al., 1999).
 - b. Use sterile surgeon's gloves (IB) ("Recommended infection control," 1993; "Update: universal precautions," 1988; Garner, 1986; CDC, 2002; Mangram et al., 1999).
 - c. Use sterile saline or sterile water as a coolant/irrigant when performing oral surgical procedures. Use devices specifically designed for delivering sterile irrigating fluids (e.g., bulb syringe, single-use disposable products, and sterilizable tubing) (IB) ("Recommended infection control," 1993; Garner, 1986).

G. Handling of Biopsy Specimens

1. During transport, place biopsy specimens in a sturdy, leakproof container labeled with the biohazard symbol (IC) ("Recommended infection control," 1993; US Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, 2001; US Department of Labor, Occupational Safety and Health Administration, "OSHA instruction," 2001).
2. If a biopsy specimen container is visibly contaminated, clean and disinfect the outside of a container or place it in an impervious bag labeled with the biohazard symbol, (IC) ("Recommended infection control," 1993; US Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, 2001).

H. Handling of Extracted Teeth

1. Dispose of extracted teeth as regulated medical waste unless returned to the patient (IC) (US Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, 2001; US Department of Labor, Occupational Safety and Health Administration, "OSHA instruction," 2001).
2. Do not dispose of extracted teeth containing amalgam in regulated medical waste intended for incineration (II).
3. Clean and place extracted teeth in a leakproof container, labeled with a biohazard symbol, and maintain hydration for transport to educational institutions or a dental laboratory (IC) (US Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, 2001; US Department of Labor, Occupational Safety and Health Administration, "OSHA instruction," 2001).

4. Heat-sterilize teeth that do not contain amalgam before they are used for educational purposes (I B) (Tate & White, 1991; Pantera & Schuster, 1990; Parsel et al., 1998).
- I. Dental Laboratory
1. Use PPE when handling items received in the laboratory until they have been decontaminated (I A, I C) ("Recommendations for prevention of HIV," 1987; "Update: universal precautions," 1988; Garner, 1996; US Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1910.1030, 2001; "Recommended infection control," 1993).
 2. Before they are handled in the laboratory, clean, disinfect, and rinse all dental prostheses and prosthodontic materials (e.g., impressions, bite registrations, occlusal rims, and extracted teeth) by using an EPA-registered hospital disinfectant having at least an intermediate-level (i.e., tuberculocidal claim) activity (I B) ("Recommended infection control," 1993; Favero & Bond, 2001; Rutala & Weber, 1998; "Infection control recommendations for the dental office," 1996).
 3. Consult with manufacturers regarding the stability of specific materials (e.g., impression materials) relative to disinfection procedures (II).
 4. Include specific information regarding disinfection techniques used (e.g., solution used and duration), when laboratory cases are sent offsite and on their return (II) ("Recommended infection control," 1993; "Infection control recommendations for the dental office," 1996; Kugel et al., 2000).
 5. Clean and heat-sterilize heat-tolerant items used in the mouth (e.g., metal impression trays and face-bow forks) (I B) ("Recommended infection control," 1993; "Infection control recommendations for the dental office," 1996).
 6. Follow manufacturers' instructions for cleaning and sterilizing or disinfecting items that become contaminated but do not normally contact the patient (e.g., burs, polishing points, rag wheels, articulators, case pans, and lathes). If manufacturer instructions are unavailable, clean and heat sterilize heat-tolerant items or clean and disinfect with an EPA-registered hospital disinfectant with low- (HIV, HBV effectiveness claim) to intermediate- level (tuberculocidal claim) activity, depending on the degree of contamination (II).
- J. Laser/Electrosurgery Plumes/Surgical Smoke
1. No recommendation is offered regarding practices to reduce DHCP exposure to laser plumes/ surgical smoke when using lasers in dental practice. Practices to reduce HCP exposure to laser plumes/surgical smoke have been suggested, including use of a) standard precautions (e.g., high-filtration surgical masks and possibly full face shields) (Streifel, 1997); b) central room suction units with in-line filters to collect particulate matter from minimal plumes; and c) dedicated mechanical smoke exhaust systems with a high-efficiency filter to remove substantial amounts of laser-plume particles. The effect of the exposure (e.g., disease transmission or adverse respiratory effects) on DHCP from dental applications of lasers has not been adequately evaluated (see previous discussion,

Laser/Electrosurgery Plumes or Surgical Smoke in original guideline document) (Unresolved issue).

- K. *Mycobacterium tuberculosis*
 - 1. General Recommendations
 - a. Educate all DHCP regarding the recognition of signs, symptoms, and transmission of TB (IB) ("Guidelines for preventing the transmission of *Mycobacterium tuberculosis*," 1994; Cleveland et al., 1995).
 - b. Conduct a baseline tuberculin skin test (TST), preferably by using a two-step test, for all DHCP who might have contact with persons with suspected or confirmed active TB, regardless of the risk classification of the setting (IB) ("Guidelines for preventing the transmission of *Mycobacterium tuberculosis*," 1994).
 - c. Assess each patient for a history of TB as well as symptoms indicative of TB and document on the medical history form (IB) ("Guidelines for preventing the transmission of *Mycobacterium tuberculosis*," 1994; Cleveland et al., 1995).
 - d. Follow CDC recommendations for 1) developing, maintaining, and implementing a written TB infection-control plan; 2) managing a patient with suspected or active TB; 3) completing a community risk-assessment to guide employee TSTs and follow-up; and 4) managing DHCP with TB disease (IB) ("Recommended infection control," 1993; Cleveland et al., 1995).
 - 2. The following apply for patients known or suspected to have active TB:
 - a. Evaluate the patient away from other patients and DHCP. When not being evaluated, the patient should wear a surgical mask or be instructed to cover mouth and nose when coughing or sneezing (IB) ("Guidelines for preventing the transmission of *Mycobacterium tuberculosis*," 1994; Cleveland et al., 1995).
 - b. Defer elective dental treatment until the patient is noninfectious (IB) ("Guidelines for preventing the transmission of *Mycobacterium tuberculosis*," 1994; Cleveland et al., 1995).
 - c. Refer patients requiring urgent dental treatment to a previously identified facility with TB engineering controls and a respiratory protection program (IB) ("Guidelines for preventing the transmission of *Mycobacterium tuberculosis*," 1994; Cleveland et al., 1995).
- L. Creutzfeldt-Jakob Disease (CJD) and Other Prion Diseases
 - 1. No recommendation is offered regarding use of special precautions in addition to standard precautions when treating known Creutzfeldt-Jakob disease (CJD) or variant Creutzfeldt-Jakob disease (vCJD) patients. Potential infectivity of oral tissues in CJD or vCJD patients is an unresolved issue. Scientific data indicate the risk, if any, of sporadic CJD transmission during dental and oral surgical procedures is low to nil. Until additional information exists regarding the transmissibility of CJD or vCJD during dental procedures, special precautions in

addition to standard precautions might be indicated when treating known CJD or vCJD patients; a list of such precautions is provided for consideration without recommendation (see Creutzfeldt-Jakob Disease and Other Prion Diseases in original guideline document) (Unresolved issue).

M. Program Evaluation

1. Establish routine evaluation of the infection control program, including evaluation of performance indicators, at an established frequency (II) ("Framework for program evaluation," 1999; Institute of Medicine, 1999).

Definitions:

Recommendation Rating Scheme

Category IA. Strongly recommended for implementation and strongly supported by well-designed experimental, clinical, or epidemiologic studies

Category IB. Strongly recommended for implementation and supported by experimental, clinical, or epidemiologic studies and a strong theoretical rationale

Category IC. Required for implementation as mandated by federal or state regulation or standard. When IC is used, a second rating can be included to provide the basis of existing scientific data, theoretical rationale, and applicability. Because of state differences, the reader should not assume that the absence of a IC implies the absence of state regulations.

Category II. Suggested for implementation and supported by suggestive clinical or epidemiologic studies or a theoretical rationale

Unresolved issue. No recommendation. Insufficient evidence or no consensus regarding efficacy exists.

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

REFERENCES SUPPORTING THE RECOMMENDATIONS

[References open in a new window](#)

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

Each recommendation is categorized on the basis of existing scientific data, theoretical rationale, and applicability (see "Major Recommendations").

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Prevention of or reduced potential for disease transmission from patient to dental health-care personnel (DHCP), from dental health-care personnel to patient, and from patient to patient.

POTENTIAL HARMS

Not stated

CONTRAINDICATIONS

CONTRAINDICATIONS

Contraindications and precautions regarding immunizations for health-care personnel are documented in Appendix B of the original guideline document.

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

This report does not include any discussion of the unlabeled use of commercial products or products for investigational use.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Staying Healthy

IOM DOMAIN

Effectiveness
Safety

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Kohn WG, Collins AS, Cleveland JL, Harte JA, Eklund KJ, Malvitz DM. Guidelines for infection control in dental health-care settings--2003. MMWR Recomm Rep 2003 Dec 19;52(RR-17):1-61. [471 references]

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FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

The subject matter experts wish to disclose they have no financial interests or other relationships with the manufacture of commercial products, providers of commercial services, or commercial supporters.

GUIDELINE STATUS

This is the current release of the guideline.

GUIDELINE AVAILABILITY

Electronic copies: Available from the Centers for Disease Control and Prevention (CDC) Web site:

- [HTML Format](#)
- [Portable Document Format \(PDF\)](#)

Print copies: Available from the Centers for Disease Control and Prevention, MMWR, Atlanta, GA 30333. Additional copies can be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402-9325; (202) 783-3238.

AVAILABILITY OF COMPANION DOCUMENTS

None available

PATIENT RESOURCES

None available

NGC STATUS

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